WHAT IS CLAIMED IS:

1. A control apparatus for an internal combustion engine that is capable of switching between compression ignition combustion and spark ignition combustion, the control apparatus comprising a control unit configured to:

perform fuel cut in accordance with operating conditions of the engine;

perform the spark ignition combustion over a time period after the fuel cut; and

permit the compression ignition combustion after the time period elapses.

2. The control apparatus of claim 1, wherein the control unit is further configured to:

determine a temperature within a combustion chamber of the internal combustion engine immediately before the fuel cut is performed; and

determine the time period based on the determined temperature within the combustion chamber.

3. The control apparatus of claim 2, further comprising a sensor for detecting a rotational speed of the internal combustion engine;

wherein the control unit is further configured to:

determine a requested engine torque; and

estimate the temperature within the combustion chamber based on the rotational speed and the requested engine torque.

4. The control apparatus of claim 2, wherein the time period is determined so that the time period is longer as the temperature within the

combustion chamber is lower.

5. The control apparatus of claim 1, wherein the time period is determined in accordance with a duration time of the fuel cut.

6. The control apparatus of claim 3, wherein the control unit is further configured to:

correct the estimated temperature so that the estimated temperature does not abruptly change.

7. A method for controlling an internal combustion engine that is capable of switching between compression ignition combustion and spark ignition combustion, the method comprising the steps of:

performing fuel cut in accordance with operating conditions of the engine;

performing the spark ignition combustion over a time period after the fuel cut; and

permitting the compression ignition combustion after the time period elapses.

8. The method of claim 7, further comprising the steps of:

determining a temperature within a combustion chamber of the internal combustion engine immediately before the fuel cut is performed; and

determining the time period based on the determined temperature within the combustion chamber.

9. The method of claim 8, further comprising the steps of:

detecting a rotational speed of the internal combustion engine;

determining a requested engine torque; and

estimating the temperature within the combustion chamber based on the rotational speed and the requested engine torque.

10. The method of claim 8, further comprising the step of determining the time period so that the time period is longer as the temperature within the combustion chamber is lower.

11. The method of claim 7, further comprising the step of determining the time period in accordance with a duration time of the fuel cut.

12. The method of claim 9, further comprising the step of correcting the estimated temperature so that the estimated temperature does not abruptly change.

13. A control apparatus for controlling an internal combustion engine that is capable of switching between compression ignition combustion and spark ignition combustion, the apparatus comprising:

means for performing fuel cut in accordance with operating conditions of the engine;

means for performing the spark ignition combustion over a time period after the fuel cut; and

means for permitting the compression ignition combustion after the time period elapses.

14. The apparatus of claim 13, further comprising:

means for determining a temperature within a combustion chamber of the internal combustion engine immediately before the fuel cut is performed; and

means for determining the time period based on the determined temperature within the combustion chamber.

15. The apparatus of claim 14, further comprising:

means for detecting a rotational speed of the internal combustion engine;

means for determining a requested engine torque; and

means for estimating the temperature within the combustion chamber based on the rotational speed and the requested engine torque.

16. The apparatus of claim 14, further comprising means for determining the time period so that the time period is longer as the temperature within the combustion chamber is lower.

17. The apparatus of claim 13, further comprising means for determining the time period in accordance with a duration time of the fuel cut.

18. The apparatus of claim 15, further comprising means for correcting the estimated temperature so that the estimated temperature does not abruptly change.